

FISH AND WILDLIFE HABITAT PURPOSE

December 6, 2005

PURPOSE

This sheet summarizes information about the existing fish and wildlife habitat at the Salton Sea and those habitats that are expected to be maintained or created through implementation of the Salton Sea Ecosystem Restoration Program.

DEFINITIONS

Shoreline/Shallow Water Habitat

The shallow shoreline areas that extend around the perimeter of the Salton Sea support an invertebrate community that serves as the forage base for numerous migratory and resident shorebirds. Its general characteristics at the Salton Sea are:

- Depth: 0-3 feet
- Salinity: about 46 milligrams per liter (mg/L)
- Common Inhabitants: shore birds, wading birds, and dabbling ducks
- Area: about 6,000 acres in a very narrow band around the shore

Open Water Habitat

Extending out from the shallow shoreline, the majority of the area of the Salton Sea provides open water that is habitat for a variety of fish and birds. A large portion of this area is subject to periodic events that lead to low oxygen levels and fish die offs.

- Depth: deeper than 3 feet
- Salinity: about 46 mg/L
- Common Inhabitants: pelicans, grebes, cormorants, and fish
- Area: more than 230,000 acres

Estuary/Delta Habitat

The estuary/delta habitats formed at the interface between the saline waters of the Salton Sea and relatively fresh inflows from the rivers and drains, particularly where the Alamo, New, and Whitewater rivers enter the Salton Sea.

- Depth: 0-10 feet
- Salinity: about 2,000 to 46,000 mg/L
- Common Inhabitants: pelicans, gulls, egrets, and waterfowl
- Area: dependent on inflow; up to about 500 acres

Islands and Snags

Several islands, such as Mullet Island and those adjacent to Obsidian Butte, occur along the margin of the Salton Sea, and provide important nesting and resting habitat for a variety of birds. Trees killed by inundation from past increases in the elevation of the Sea also provide important roosting and nesting opportunities.

- Common Inhabitants: cormorants, skimmers, terns, gulls, herons, and egrets

- Area: island area dependent on Sea elevation. Up to about 25 acres at recent Sea elevations.
- Five snag fields: about 240 acres that contain snags

Freshwater Marsh

Freshwater marsh is present in the agricultural areas and refuges around the Salton Sea. These areas, which are supplied by Colorado River water, occur primarily as seasonal wetlands to support waterfowl and duck hunting and as permanent marsh managed on the refuges for rails.

- Depth: 0-6 feet
- Salinity: about 650 mg/L
- Common Inhabitants: rails, shorebirds, and waterfowl
- Area: total of about 13,000 acres located on private land, the Imperial Wildlife Area, and the Sonny Bono Salton Sea National Wildlife Refuge

Agricultural Areas

Agriculture occurs on over 500,000 acres in the Salton Sea basin in the Imperial and Coachella valleys. Crop type and irrigation practices strongly influence the value of agricultural areas as habitat, thus only a subset of these acres provides habitat for birds at a given time. Many birds use agricultural fields for foraging and roosting in addition to their use of habitats in the Salton Sea basin. Two bird species dependent on agricultural habitat include burrowing owl and mountain plover.

SALTON SEA HABITAT VALUES

The Salton Sea supports several habitats that help to maintain a diverse assemblage of fish and birds.

Shoreline/Shallow Water Habitat

Bird use of these areas is generally concentrated in depths of 1 foot or less where invertebrate prey is accessible by wading and probing. The amount of shallow water areas is influenced by topography and changes in Sea elevation, with a relatively narrow band of habitat occurring on the steeper slopes (e.g., eastern and western shores) and considerably greater amounts of accessible habitat along the more gently sloping north and south shores. The shore itself also functions as a resting area for many birds and as nesting for some (e.g., snowy plover).

Open Water Habitat

Open water is used primarily by water birds, including those that feed on fish. Some species rely on open water almost exclusively during their stay at the Salton Sea, while others use open water for a portion of their daily or seasonal activities. Birds use open water for foraging, rafting, and as a staging area prior to migration. Open water also provides birds with protection from most predators and human disturbance.

Most of the open water areas of the Salton Sea are subject to periodic events that can make large portions of the Sea lethal or uninhabitable to most aquatic life. When the

Salton Sea becomes stratified, the water quality characteristics in the lower layer produce toxic compounds, such as hydrogen sulfide. The toxic components are periodically released to the surface waters when the stratification breaks down. During these events, aquatic life can be stressed or killed over vast areas of the Sea.

The distribution of fish and wildlife in the open water habitat is concentrated along the near shore areas. Researchers identify the area extending a distance of about 0.6 miles from the shore as the area of greatest use by fish and birds. This band around the Sea encompasses an area of about 38,000 acres.

Estuary/Delta Habitat

Contributing to the value of the shallow shoreline and open water habitats are the estuary/delta habitats. While these areas are not used exclusively by any one species, they routinely support higher concentrations of birds than surrounding areas. This high use relative to other areas likely is attributable to several factors including proximity to agricultural lands and refuges, availability of freshwater, and as buffers against extreme water temperatures, and salinities. These habitats may also serve as refugia for aquatic species during episodes of low oxygen.

By comparison to other habitat types, estuary/delta habitats are relatively small, yet very productive. The size of these areas is influenced primarily by the amount of inflow.

Islands and Snags

Several islands along the margin of the Salton Sea provide important nesting and resting habitat for a variety of birds. Except for Mullet Island, these areas are generally very small, lack vegetation, and influenced by water surface elevation. These features are critically important and possibly limit several bird species.

Trees killed by inundation from past increases in the elevation of the Salton Sea also provide important roosting and nesting opportunities for herons, egrets, and other birds. These structures are not permanent, and they continue to degrade and collapse over time.

Freshwater Marsh

The areas managed for waterfowl consist of open shallow water (generally less than 1 foot depth) intermixed with emergent aquatic vegetation (e.g., cattails). While much of the freshwater marsh area is managed for waterfowl, many others, including shorebirds and marsh birds, also benefit. These areas also provide a freshwater source necessary to support the physical and physiological requirements of many of the birds that use the Salton Sea.

Most freshwater habitats are not directly linked to changes in inflow to the Salton Sea and would not be expected to decrease as a result of reduced inflow.

Agricultural Areas

More than 60 species of birds have been observed using agricultural areas of the Imperial and Coachella Valleys. The extent to which these species use agricultural fields varies considerably. A few species exclusively occur in agricultural areas while

they are in the area and their continued presence in the Salton Sea Basin could depend on the persistence of agriculture.

The value of agricultural fields as habitat is influenced by crop type and irrigation practices. Crops with dense structure (e.g., sugarcane and citrus orchards) provide cover and roosting sites for birds such as blackbirds and doves. In addition, some crops produce seed or vegetation that contributes to the diet. Irrigation practices also influence the value of agricultural habitats. Flood irrigation, especially on perennial crops such as alfalfa, creates foraging opportunities for species such as cattle egrets, white-faced ibis, California gulls, and long-billed curlews as invertebrates and rodents are forced to the surface by the irrigation water.

RANGE OF RESTORATION ACTIONS

The goal of the ecosystem restoration program is to restore the Salton Sea ecosystem and achieve the permanent protection of the wildlife dependent on that ecosystem. Achievement of this goal will require retaining or replacing the value and function of the habitats described above.

FUTURE HABITATS

Inflows to the Salton Sea from the various rivers and drains provide the water that supports the shoreline/shallow water, open water, and estuary/delta habitats in the Salton Sea. Without intervention, the Salton Sea would recede and stabilize at a surface elevation considerably lower than its current elevation. Water quality would continue to degrade and habitat values would decline.

To stabilize conditions and retain or improve some of the habitat values of the Salton Sea, several of the restoration alternatives include various methods of partitioning the Sea to create a stable marine sea. In these alternatives, salinity would be stabilized in the marine sea portion by controlling the inflow and creating an outlet that would discharge to the other side of the partition into a portion of the current Sea-bed.

Some alternatives rely on creation of a diverse saline habitat shallower than a marine sea to replace some of the lost habitat function of the Salton Sea. This habitat, referred to as saline habitat complex, would be created by impounding inflows behind small berms in areas excavated and graded to create a range of water depth and features such as small islands.

All the alternatives include a highly saline water body that would receive discharges from managed habitat areas and water during periods of surplus flow (e.g., wet weather events). This brine sink would continue to provide habitat for various species until salinity rises above the level necessary to support aquatic life, including invertebrates. The brine sink, however, likely would be negatively influenced by factors such as eutrophication and salinity, and would provide lower quality habitat relative to a marine sea or saline habitat complex.

All of the alternatives would include an adaptive management strategy for developing technical solutions to address any performance issues.

Marine Sea

Salinity in the marine sea would be maintained within a range that supports fish and fish-eating birds. The range of depths would depend on the configuration and location of the marine sea. Other water quality parameters that influence the quality of habitat (e.g., nutrients and selenium) could be managed by treatment of inflow. Under these conditions, the marine sea would be expected to support a fish and invertebrate community similar to current or recent historical conditions in the Salton Sea, and provide shoreline and open water habitats that would continue to support birds, although the smaller size would result in a substantial reduction in the amount of available habitat. In addition, the reduced size could result in an increased level of human disturbance that could diminish the value of the habitat for wildlife. Estuary/delta habitats likely would be diminished because the inflow from the rivers could require modification in order to convey water to the marine sea and for purposes of air quality management.

Saline Habitat Complex

The majority of invertebrate and fish production that supports bird foraging in the Salton Sea is within the shallow, saline waters up to about 10 feet deep. To simulate the productivity of this habitat, some alternatives include a series of berms and/or levees to be constructed along the lower contours as the sea level recedes to create habitats of various salinities and depths. These areas would provide habitat for invertebrates and, in the areas with lower salinities, the fish necessary to support a wide variety of birds. Water management actions would maintain salinity and other water quality parameters within ranges necessary to maintain habitat and a suitable prey base for birds. Salinity would range from about 20,000 mg/L up to potentially 200,000 mg/L. The hypersaline habitat (greater than 60,000 mg/L) would support the production of invertebrates especially brine flies and brine shrimp. Water would flow through the habitat areas to control salinity, flowing from one habitat area to another before being discharged to the brine sink.

Brine Sink

Water not used for habitat development or air quality management would be discharged to the brine sink. In early years of implementation, this would retain some habitat value for species that are adapted to highly saline environments. Ultimately, increasing salinity in the brine sink would reduce its habitat value and attractiveness to birds.